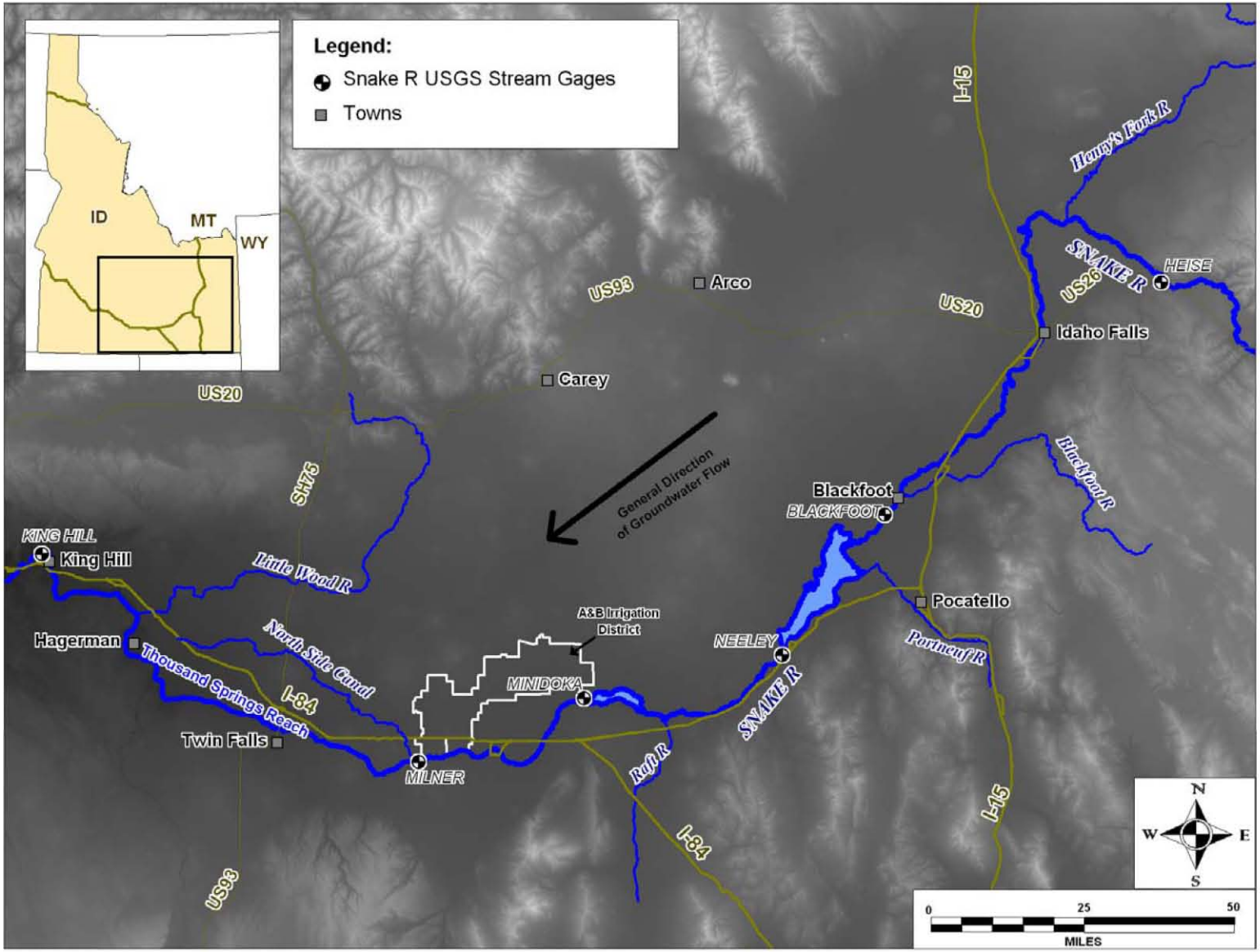

Source: IDWR; USGS

Location Map

Exhibit 440

UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary

GEOLOGICAL SURVEY
W. C. Mendenhall, Director

Water-Supply Paper 774

GEOLOGY AND GROUND-WATER RESOURCES OF THE SNAKE RIVER PLAIN IN SOUTHEASTERN IDAHO

BY

HAROLD T. STEARNS, LYNN CRANDALL
AND WILLARD G. STEWARD

Prepared in cooperation with the
IDAHO BUREAU OF MINES AND GEOLOGY
and the
IDAHO DEPARTMENT OF RECLAMATION

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1938

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - Price $1.25

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GEOLOGY AND GROUND-WATER RESOURCES OF THE SNAKE RIVER PLAIN IN SOUTHEASTERN IDAHO

By HAROLD T. STEARNS, LYNN CRANDALL, and WILLARD G. STEWARD

ABSTRACT

The part of the Snake River Plain above King Hill, Idaho, is about 250 miles long and has a general eastward trend. This region and the alluvial valleys immediately tributary to it contain about 16,000 square miles. The principal cities in the region are Pocatello, Idaho Falls, and Twin Falls. The discharge of the Snake River at King Hill averages about 9,000,000 acre-feet a year.

The chief purpose of the investigation here recorded was to obtain data regarding the source, movement, and disposal of the ground-water supply of the lava plains that occupy most of the region. By assembling and correlating numerous well records obtained in this and related investigations, tied together by a system of levels, it has been possible to prepare a map of the region showing contours of the water table. This map (pl. 19) shows the direction of movement of ground water in all parts of the region and hence largely indicates the source and disposal of the water. As the altitude of most places in the region is known, this map makes it possible to predict the depth necessary for a well to obtain water. The total annual ground-water supply of the Snake River Plain is here estimated at 4,000,000 acre-feet, of which only a small part is now utilized for irrigation. One result of the study is the conclusion that, in order to conserve this supply, it is desirable so far as practicable to confine future irrigation development to the southeast side of the Snake River above Milner, so that the seepage water may return to a stretch of the river where it will be available for reuse. By heeding this hydrologic condition more land can be irrigated with the remaining available water supply than will be possible if the water is used on the northwest side of the river, because most of the return flow from the northwest side enters the river at too low an altitude to be used again.

The geology of the region in its relation to water supply has been studied with care, and much new information of many kinds has been obtained. One of the principal results of this study is the conclusion that the exceptionally large springs along the canyon of the Snake River owe their existence to the fact that the modern canyon intercepts a series of roughly parallel former canyons of the river that are now filled with especially permeable lava and hence serve as channels for ground water. The coves present where many of the springs emerge are thought to have been formed to some degree by solution. Light is thrown on other peculiarities of the behavior of ground water in basalt by a study of the exceptionally well exposed and very recent volcanic area of the Craters of the Moon National Monument.

The losses and gains in different stretches of the Snake River are estimated on the basis of available stream-flow records. An inventory of the water supply of the plain and its tributary valleys is made. The springs in and near the Snake River Plain are described, and all available records of their discharge are tabulated. Many of the heretofore unpublished ground-water conditions in both the plain and the tributary valleys are summarized.

Depiction of Canyon Filling Process

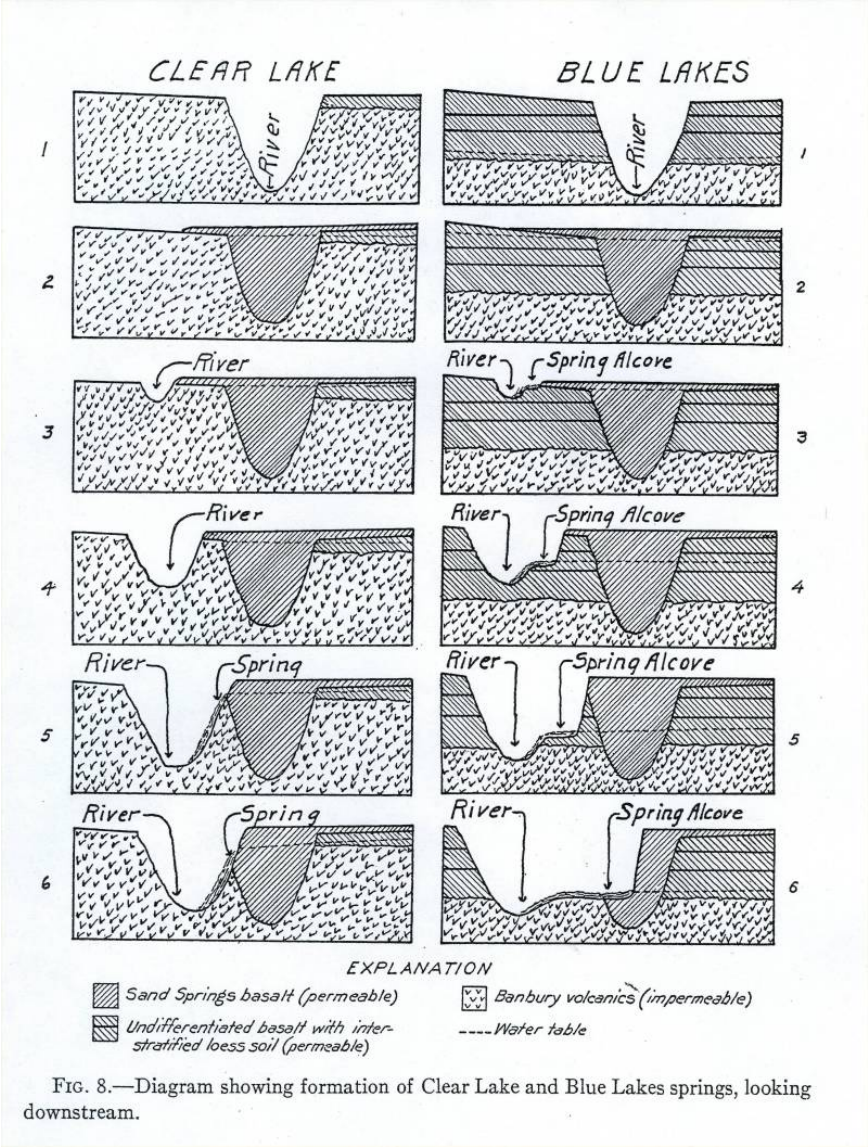


FIG. 8.—Diagram showing formation of Clear Lake and Blue Lakes springs, looking downstream.

Source: Stearns, 1938

Exhibit 442

Rift Zones and Caldera in the Eastern Snake Plain Aquifer

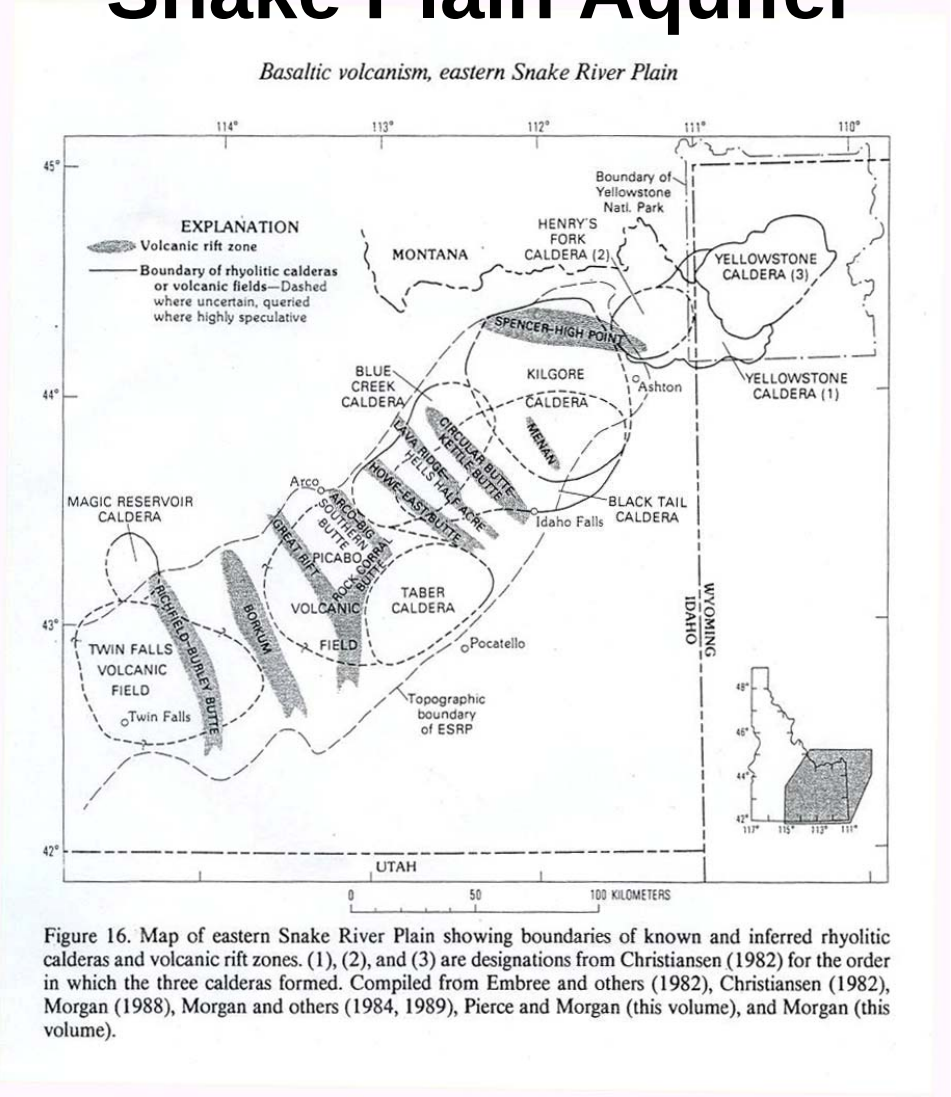


Figure 16. Map of eastern Snake River Plain showing boundaries of known and inferred rhyolitic calderas and volcanic rift zones. (1), (2), and (3) are designations from Christiansen (1982) for the order in which the three calderas formed. Compiled from Embree and others (1982), Christiansen (1982), Morgan (1988), Morgan and others (1984, 1989), Pierce and Morgan (this volume), and Morgan (this volume).

Source: Geological Society of America, 1992

Exhibit 443

Change in Ground Water Storage, 1912-80

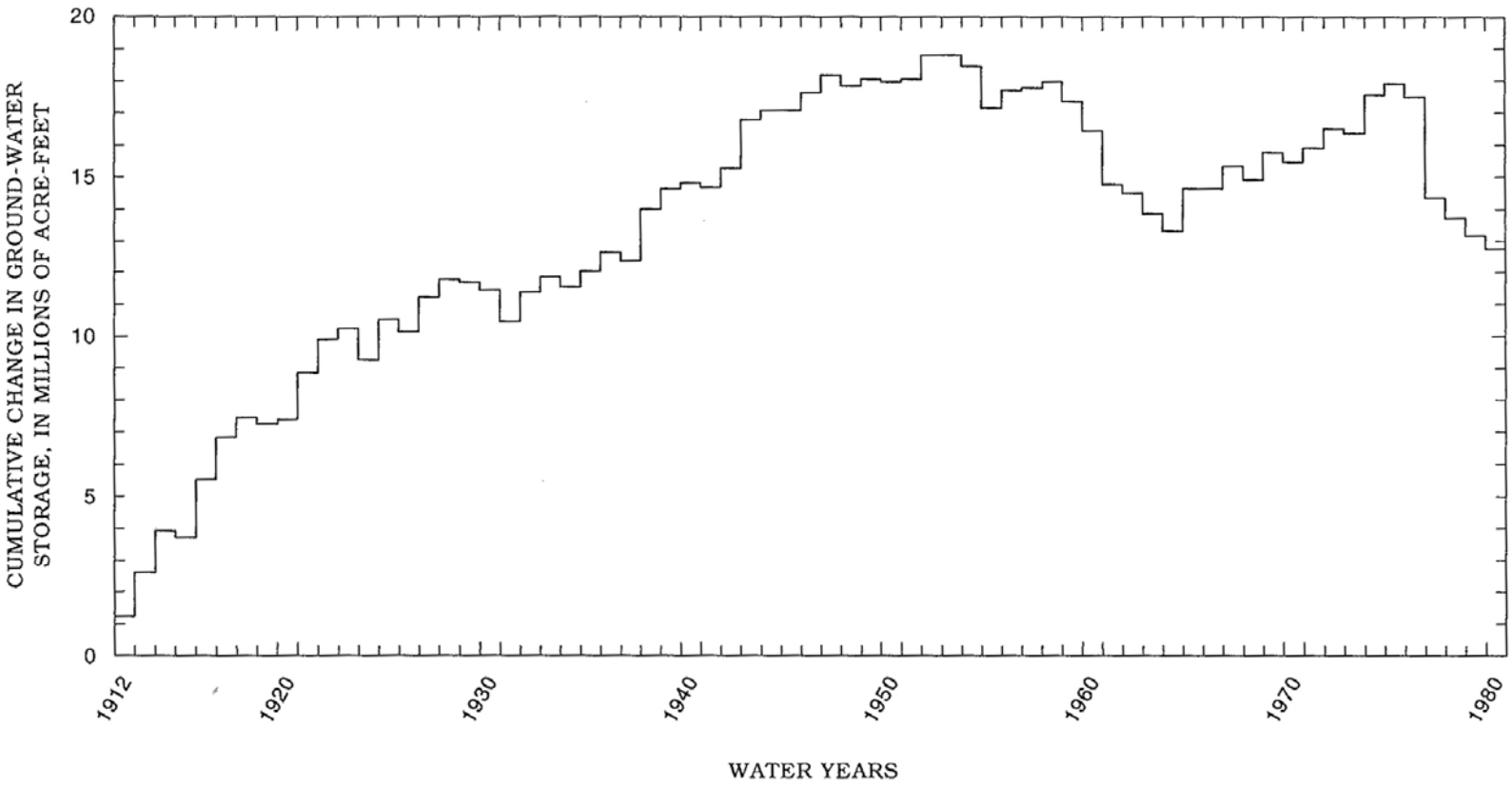


FIGURE 42.—Cumulative annual changes in ground-water storage, main part of the eastern Snake River Plain, water years 1912–80.

Source: Kjelstrom, 1995

Exhibit 444

Irrigated Acres on Snake River Plain, 1899

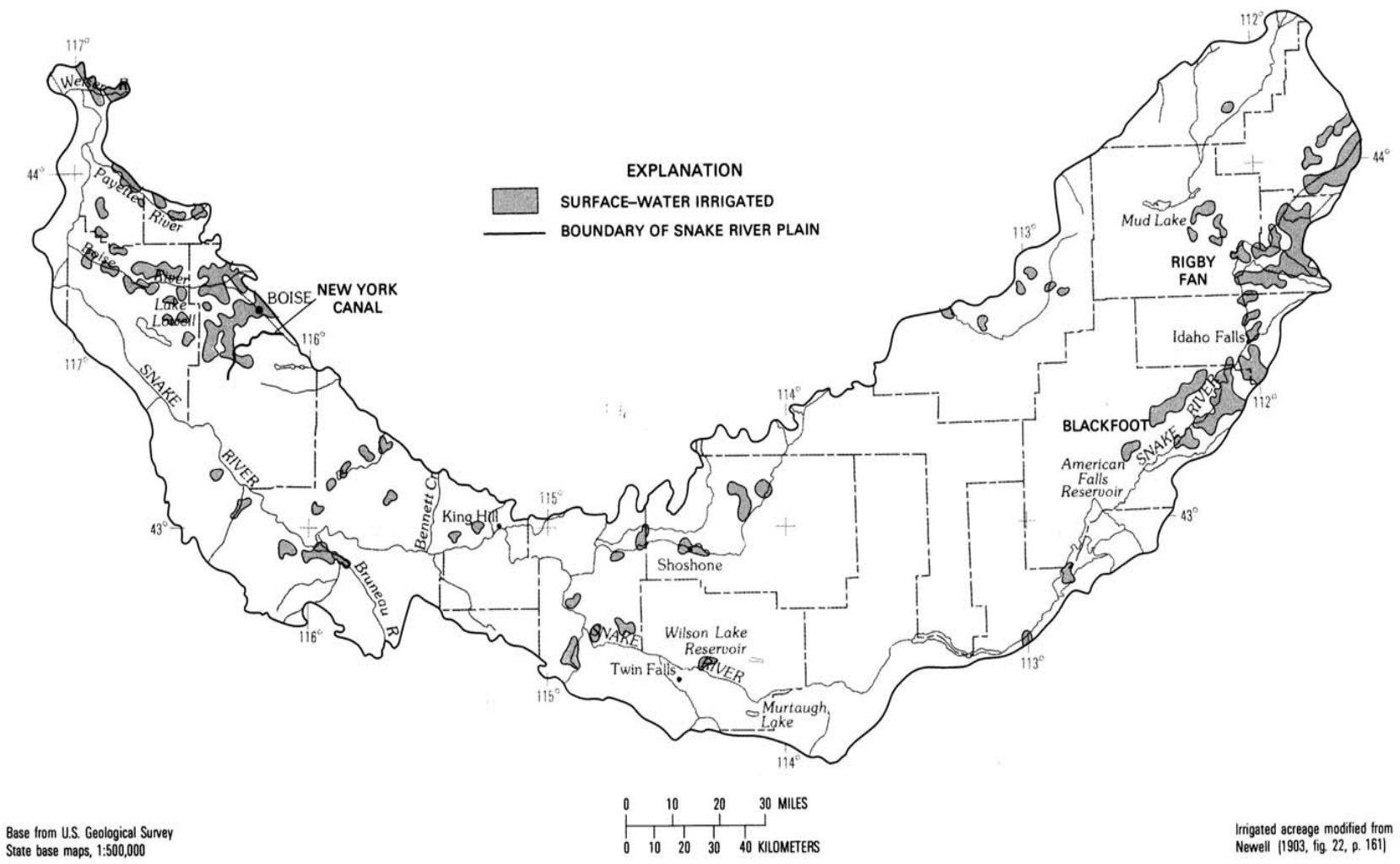


FIGURE 7.—Irrigated acreage, 1899.

Source: Goodell, 1988

Exhibit 445

Irrigated Acres on Snake River Plain, 1929

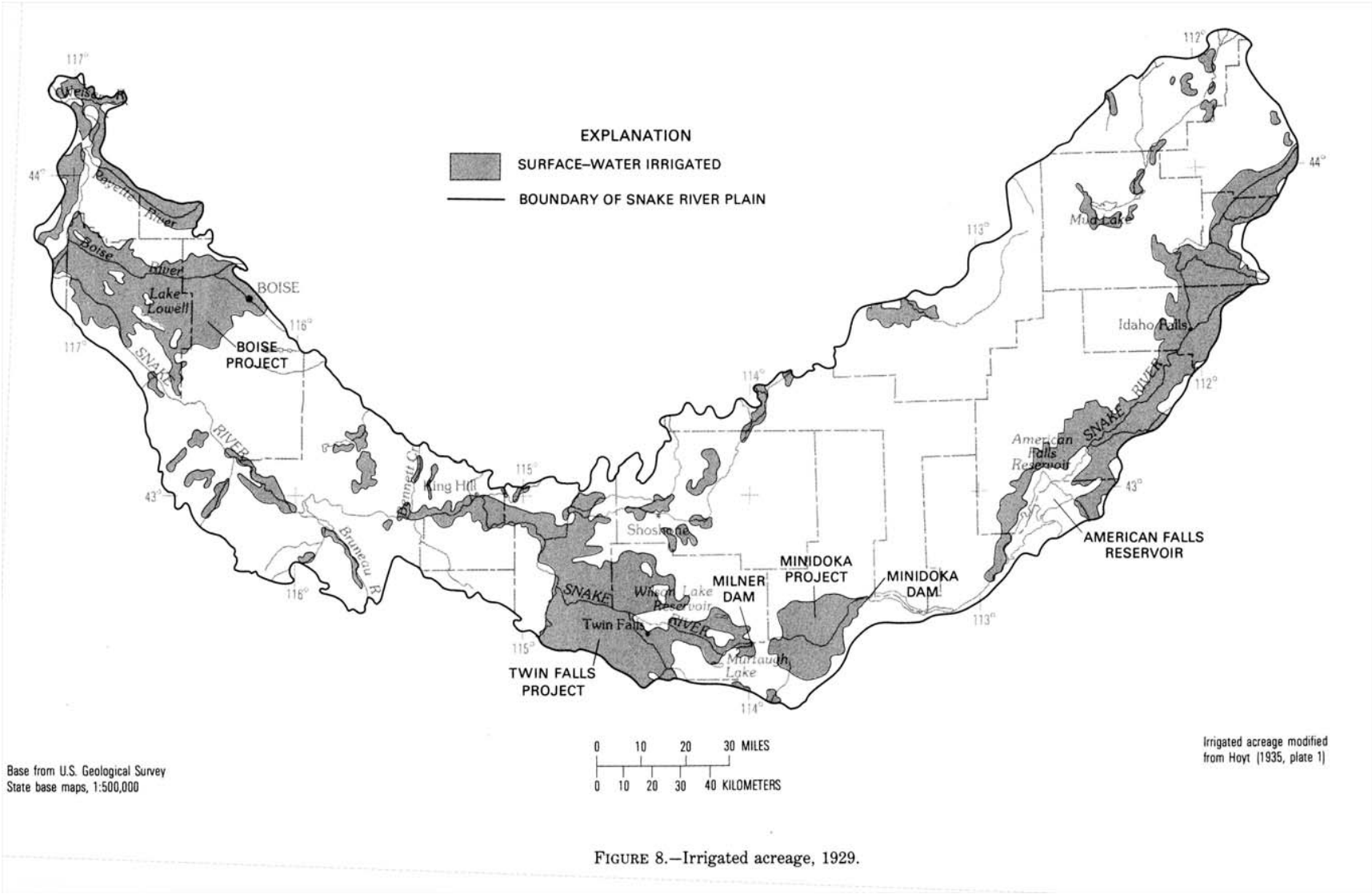


FIGURE 8.—Irrigated acreage, 1929.

Source: Goodell, 1988

Exhibit 446

Irrigated Acres on Snake River Plain, 1945

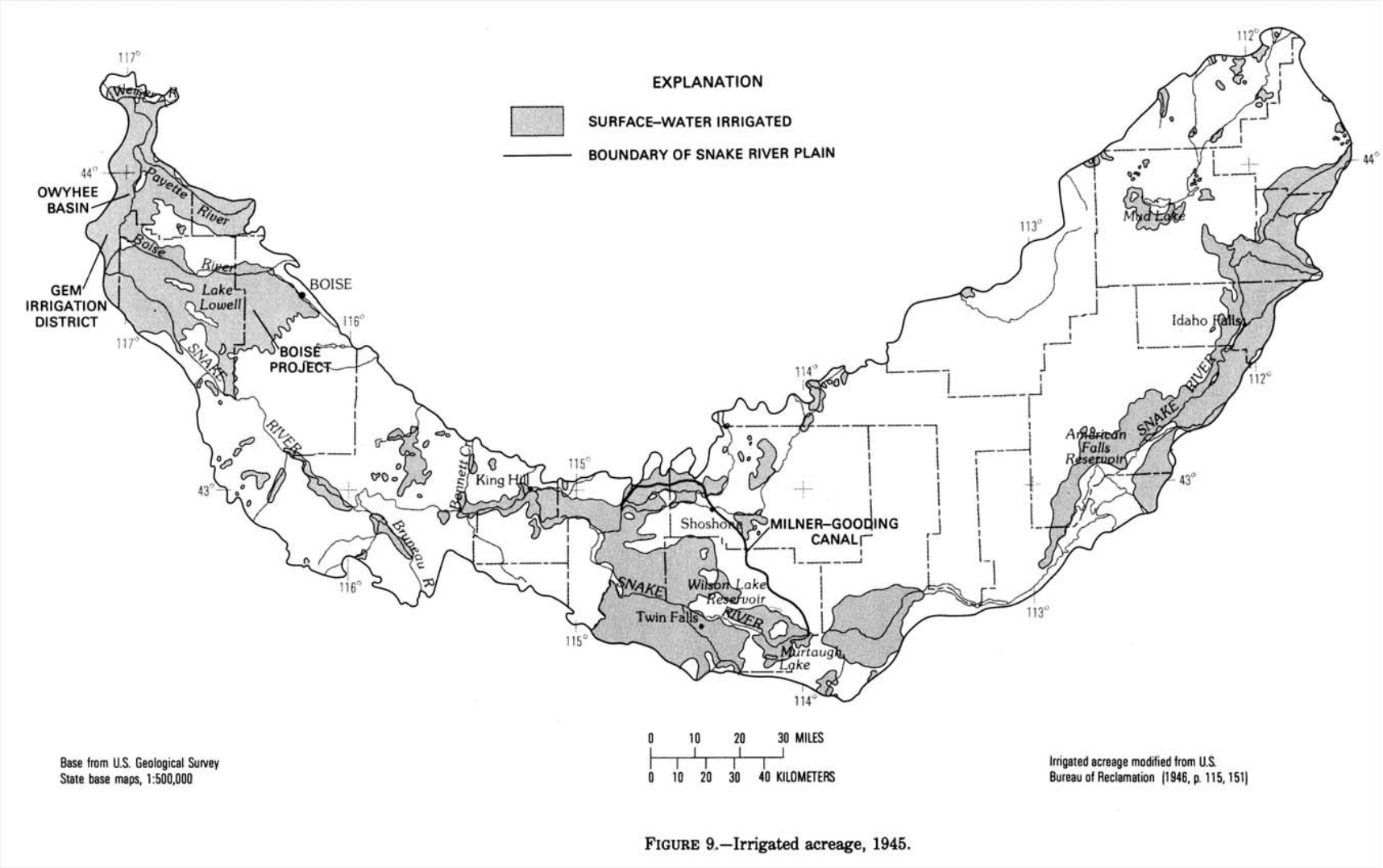


FIGURE 9.—Irrigated acreage, 1945.

Source: Goodell, 1988

Exhibit 447

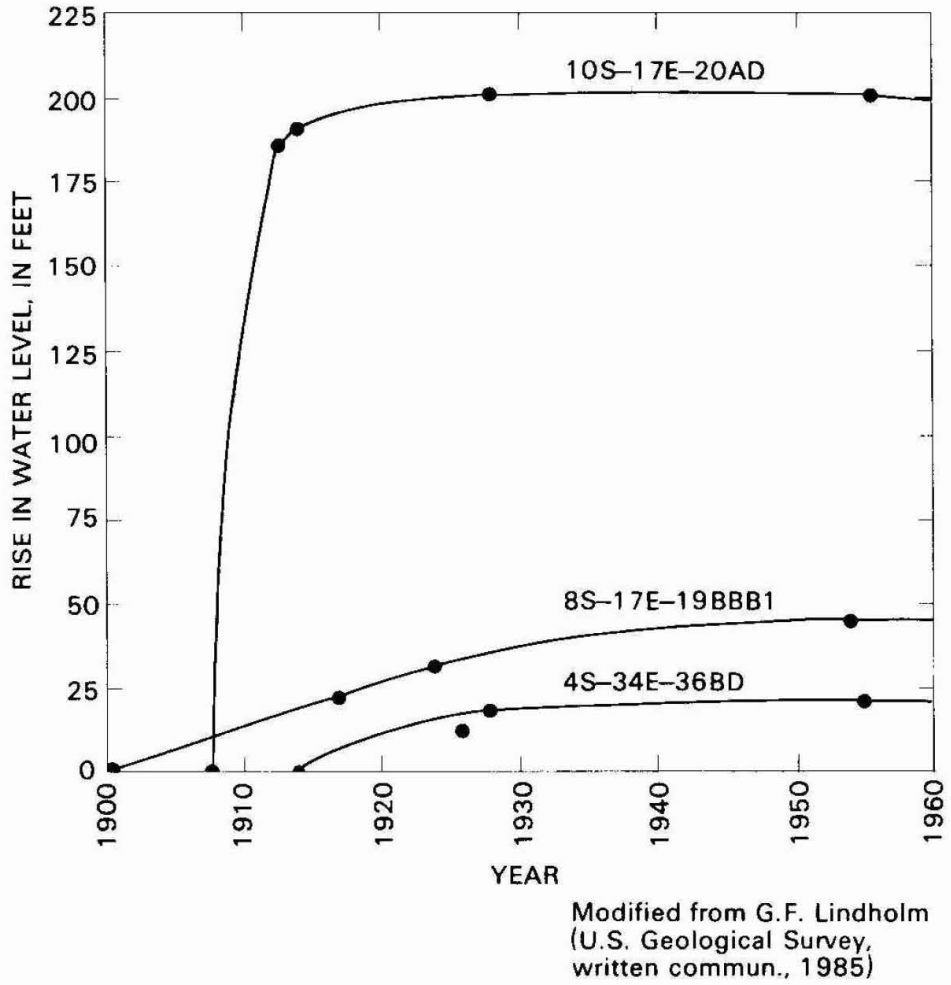


FIGURE 23.—Water-level rises in three wells, 1900–1960.

Source: Goodell, 1988

Exhibit 448

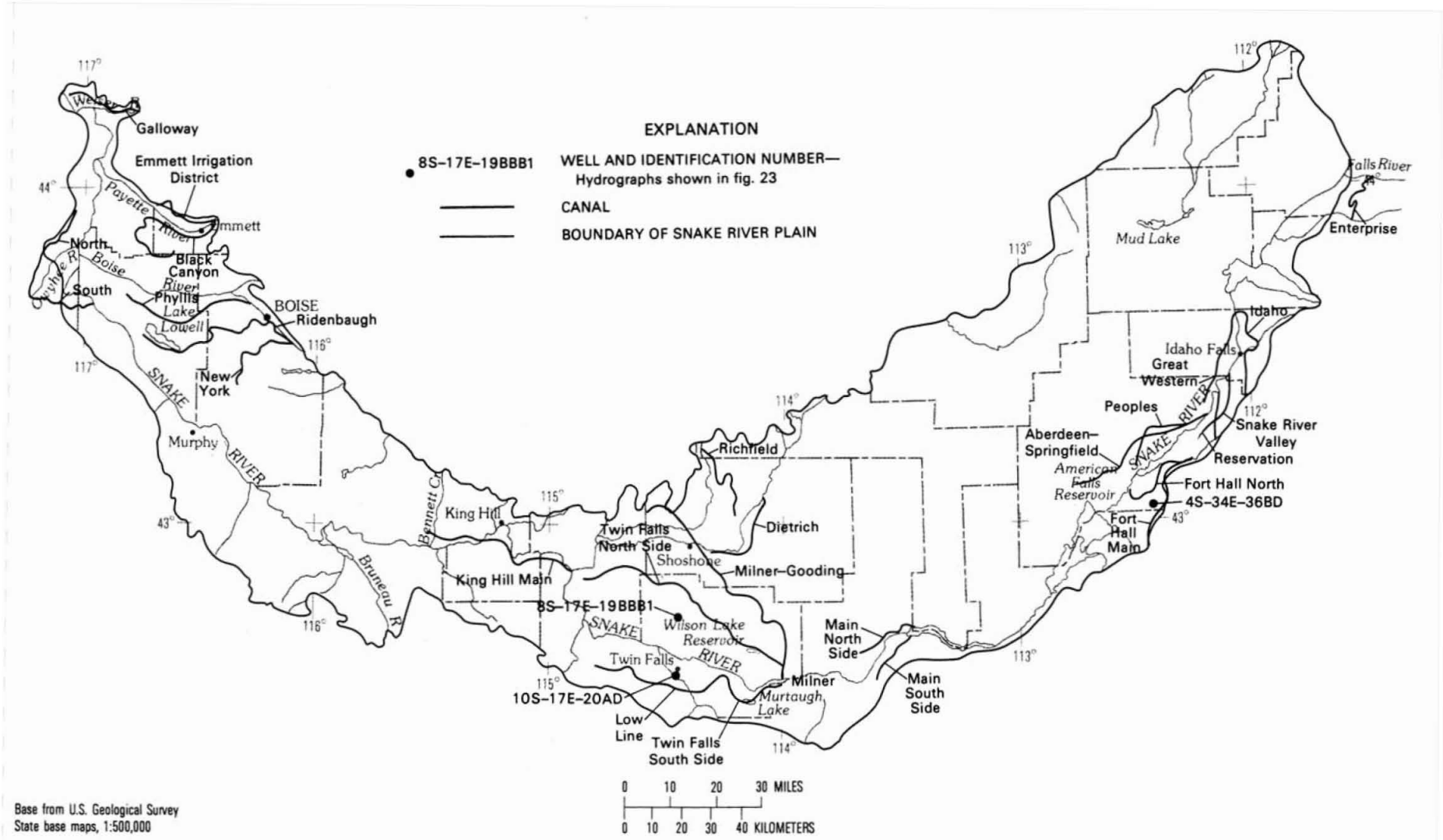


FIGURE 15.—Locations of major canals.

Source: Goodell, 1988

Exhibit 449

Water Level Rise in A&B Area, 1927- 48

Comparison of water levels in wells, in feet below land-surface datum, 1928 and 1947.

Well number	Date	Depth to Water (feet)	Net Change
6S 23E-26cc1	June 14, 1928	354.7	
	Nov. 4, 1947	360.6	-5.9
31da1	June 20, 1928	294.9	
	Nov. 4, 1947	290.7	/ 4.2
7S 23E-25cc1	June 9, 1947	260.3	
	June 10, 1947	259.2	
	June 24, 1947	258.5	/ 1.8
7S 25E-9dc1	June 14, 1928	227.4	
	Nov. 8, 1947	220.0	/ 5.4
15dc1	June 14, 1928	263.1	
	Nov. 8, 1947	262.7	/ 0.4
8S 22E-13cc1	Nov. 15, 1928	315.0	
	Oct. 30, 1947	322.4	- 7.4
8S 23E-16da1	July 7, 1928	190.6	
	Oct. 30, 1947	187.9	/ 2.7
8S 25E-33ab1	Mar. 29, 1927	88.0	
	May 18, 1927	83.0	
	July 16, 1927	80.0	
	Sept. 6, 1927	77.6	
	Oct. 14, 1927	78.8	
	Oct. 31, 1947	74.4	/13.6[a]
9S 24E-1dc1	Mar. 30, 1927	64.5	
	May 19, 1927	65.0	
	May 24, 1927	65.4	
	July 7, 1927	61.7	
	Sept. 7, 1927	62.3	
	Oct. 17, 1927	61.1	/ 3.4

[a]This is the only well in the area in which water-level measurements are available for 1927 and 1947 in the same month of the year. Note that the seasonal fluctuation is at least 9.2 feet and that the net change, October to October, is actually only / 4.4 ft.

Source: Nace, 1948

Exhibit 450

Early Records of Water Level Change in ESPA

Well		Depth to water		Depth to water		Change (feet)
No.	Location	Date	Feet	Date	Feet[1]	
6S–13E–6dd	Bliss railroad station	Before 1901[2]	430	1959	350	+80
8S–15E–28ba		1909	94	1959	62	+32
7S–15E–sec. 33	Wendell	1907	190	1959	150	+40
7S–15E–sec. 8	Railroad	1907	215	1959	190	+25
5S–15E–sec. 31 or 32	Gooding	1907	145	1959	[3] 110	+35
6S–17E–2ab(?)	Shoshone	1890	Dry at 280	1952	210	+70
8S–17E–19bb1	Jerome	1907	342	1954	298	+44
8S–18E–15cc		1907	318	1959	200	+118
4S–19E–26da1	Richfield, railroad	1913	330	1957	311	+19
9S–19E–15ac		1907	252	1959	160	+92
9S–19E–26	Eden railroad station	1912	189	1959	127	+62
6S–20E–15da	Owinza railroad station	Before 1901[2]	341	1959	200	+141
7S–23E–5	Kimama railroad station	do	265	1959	210	+55
8S–25E–1cb1	Minidoka railroad station	do	375	1959	185	+190
9S–24E–29aa1	Rupert	1905	101	1951	[3] 59	+42

[1] Estimated from water-table map or from measurement made in well having the same or nearly the same depth and location as original well.
[2] Data from Russell (1902).
[3] Water level in well of equivalent depth. Deeper aquifers have somewhat lower water level, but the original position is not known.

Source: Mundorff, 1964

Exhibit 451

Relationship Between Surface Water Diversion, Ground Water Elevation, and Spring Discharge

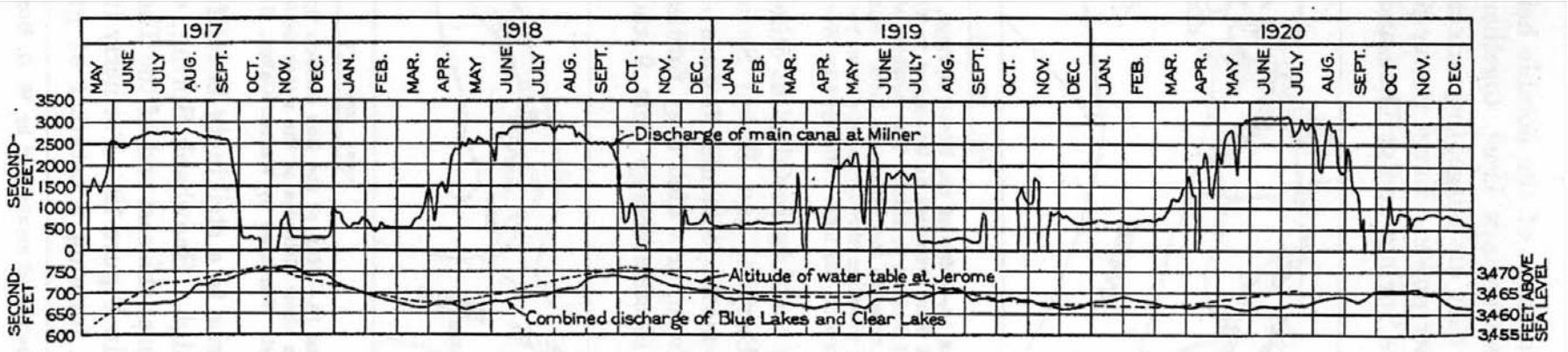


FIGURE 13.—Fluctuations in the discharge of two large springs on Snake River, Idaho (Blue and Clear Lakes), in relation to the quantity of irrigation water placed upon the upland back of these springs and to the fluctuations of the water table at Jerome, Idaho, on the upland. Diagram prepared by the engineering department of the Twin Falls North Side Land & Water Co.

Source: Meinzer, 1927

Exhibit 452

Increases in Spring Discharge Following North Side Canal Company Development

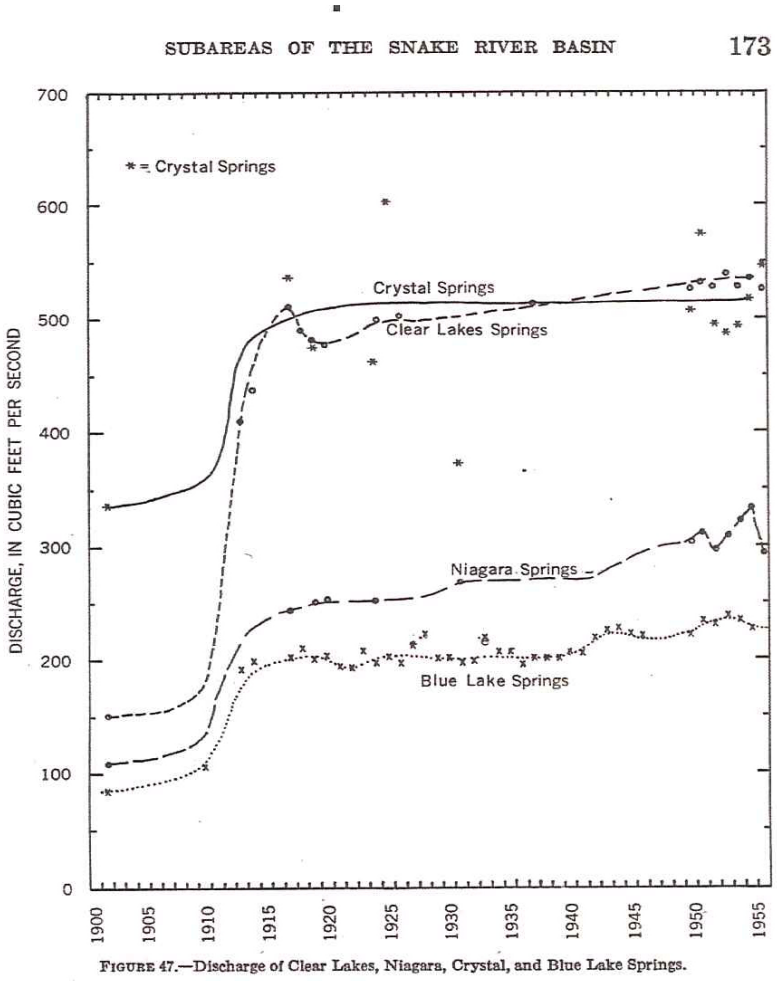


FIGURE 47.—Discharge of Clear Lakes, Niagara, Crystal, and Blue Lake Springs.

Source: Mundorff, 1964

Exhibit 453

Irrigation Improvements Survey, 1977

Table 3.41. Have You Done Anything since 1977 that Would Help Deal with Future Droughts?

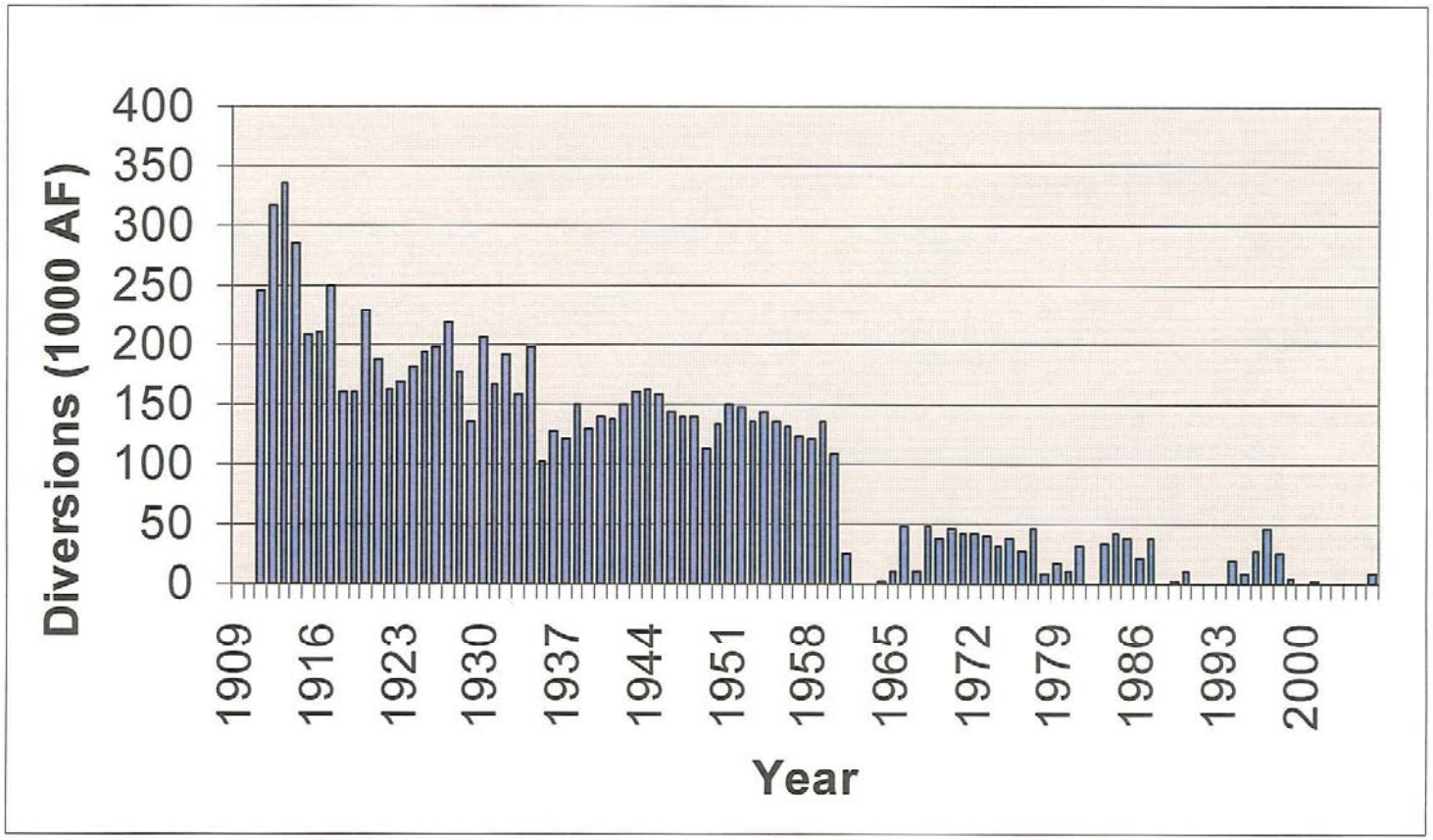
	Ada-Canyon Counties		Blaine-Lincoln Counties		Bingham-Bannock Counties		All Three Areas	
	#	%[1/]	#	%	#	%	#	%
No Changes	37	52.9	12	27.9	17	44.7	66	43.7
Put In Wells	7	10.0	5	11.6	3	7.9	15	9.9
Put In Sprinklers	4	5.7	11	25.6	7	18.4	22	14.6
Added Gated Pipe	6	8.6	4	9.3	0	-	10	6.6
Lined Ditches	7	10.0	6	14.0	2	5.3	15	9.9
Land/Layout Improvements	5	7.1	3	7.0	8	21.1	16	10.6
Other	17	24.3	8	18.6	10	26.3	35	23.2
Total Reported Changes	83	-	50	-	40	-	173	-
Farmers Reporting Changes	33	47.1	31	72.1	21	55.3	85	56.3

[1/] Percent of questionnaires.

Source: Hamilton et al., 1981

Exhibit 454

Historical Winter (Nov-Mar) Diversions, North Side Canal Company

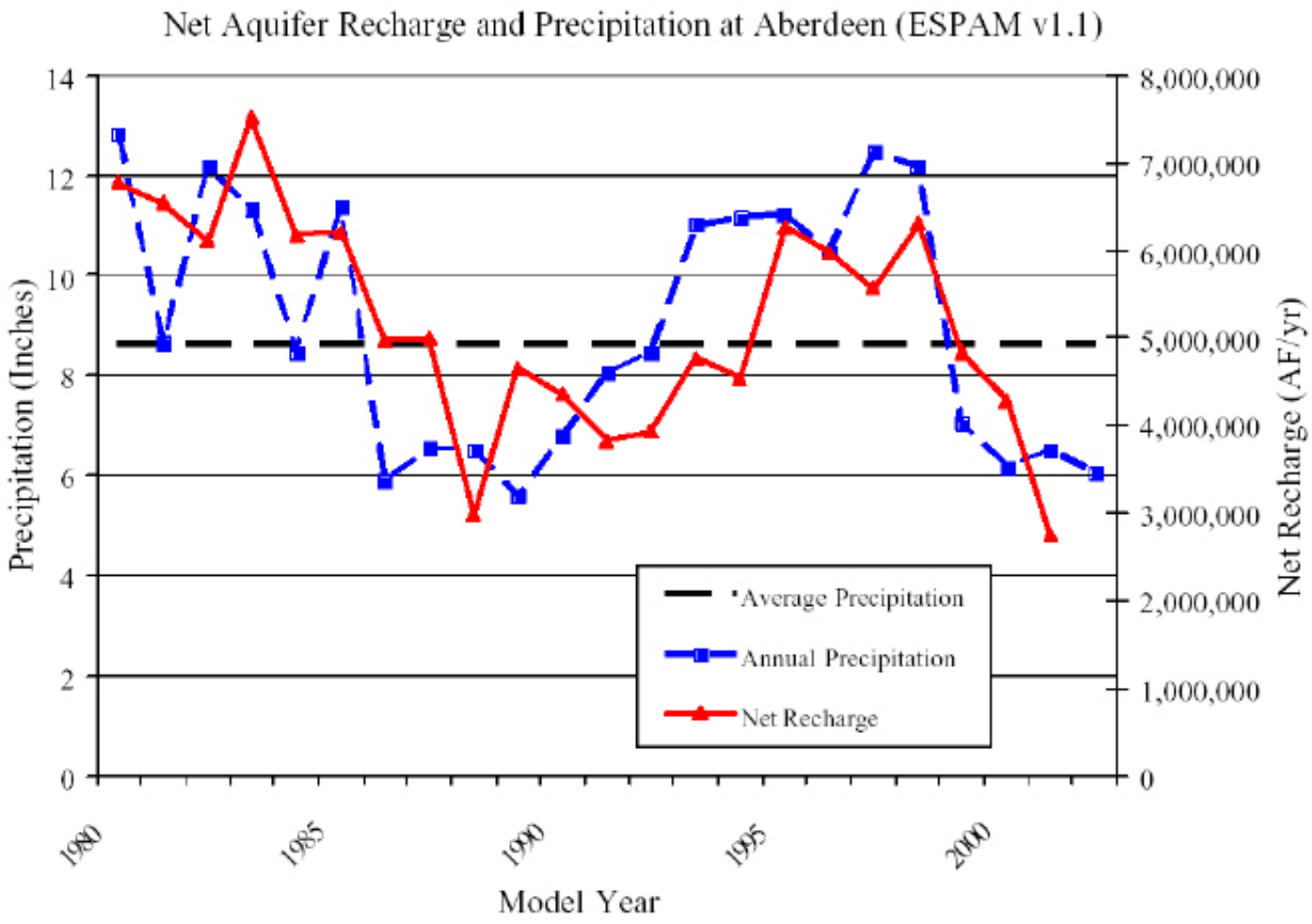


Average Diversions 1909-1960:
163,034 AF
Average Diversions 1961-2006:
19,300 AF

Source: IDWR, USGS

Exhibit 455

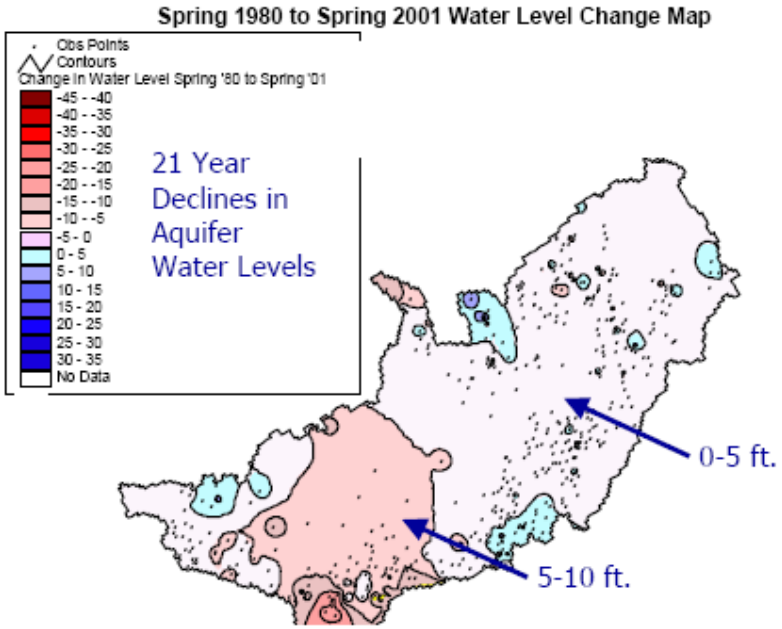
Importance of Precipitation to Aquifer Recharge

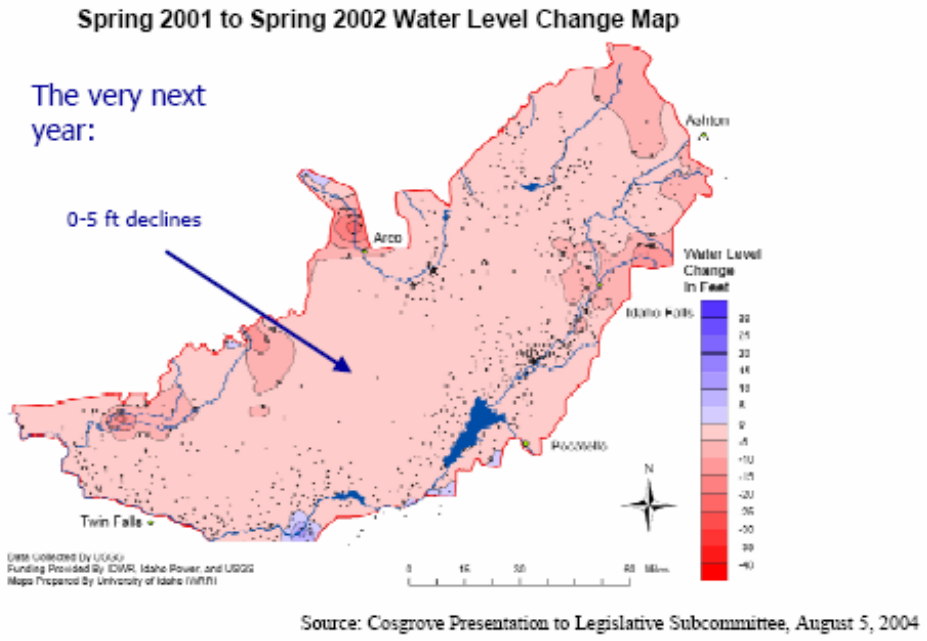


Source: IWRRI, 2005b, http://www.if.uidaho.edu/%7ejohnson/BaseCase Final v1-1 mod.pdf, p.8

Exhibit 456

Aquifer Water Level Changes: 1980-2001 and 2001-2002





Source: Cosgrove Presentation to Legislative Subcommittee, August 5, 2004

Source: Goodell, 1988

Exhibit 457

Irrigated Acres on Snake River Plain, 1966

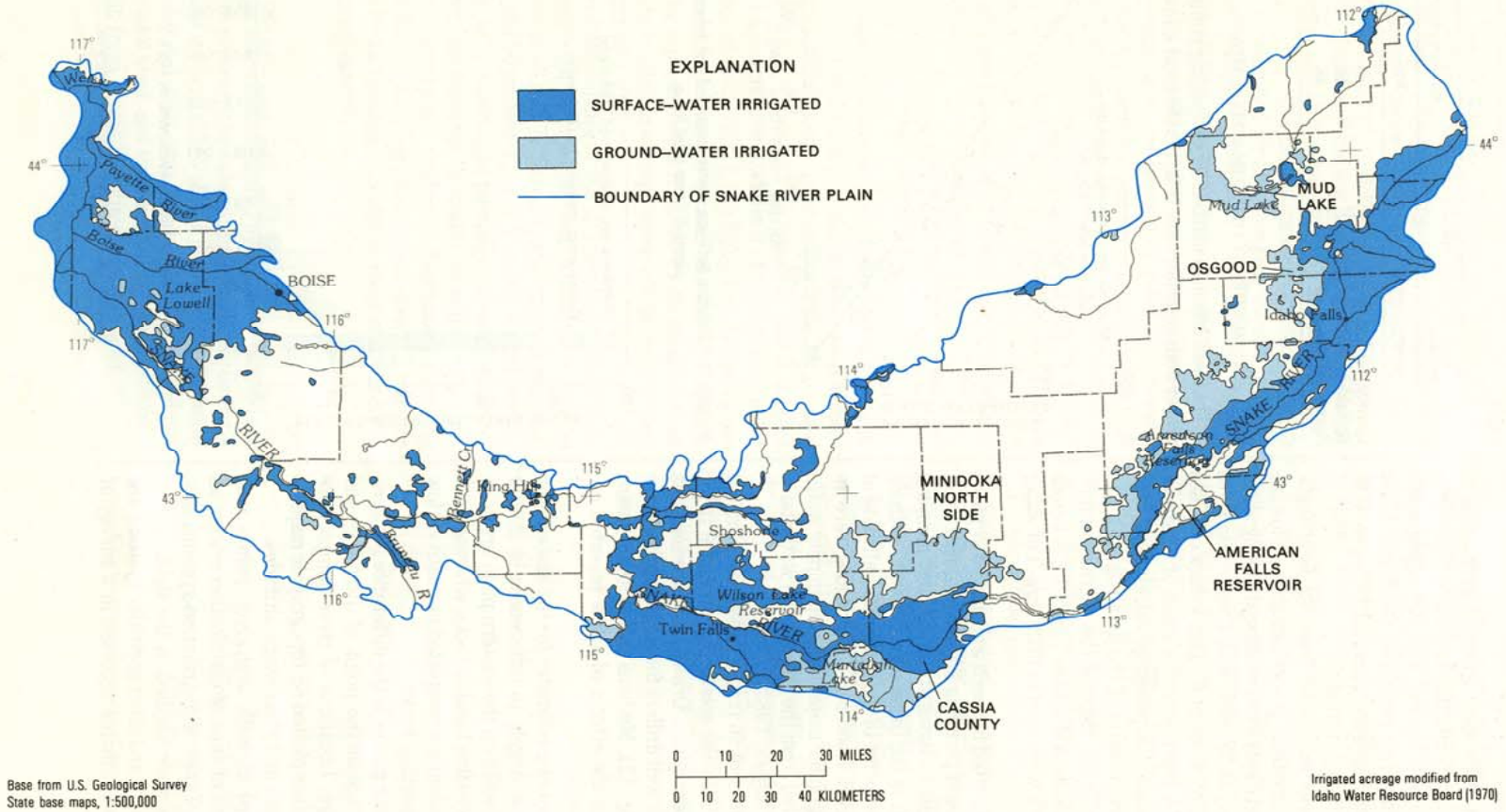


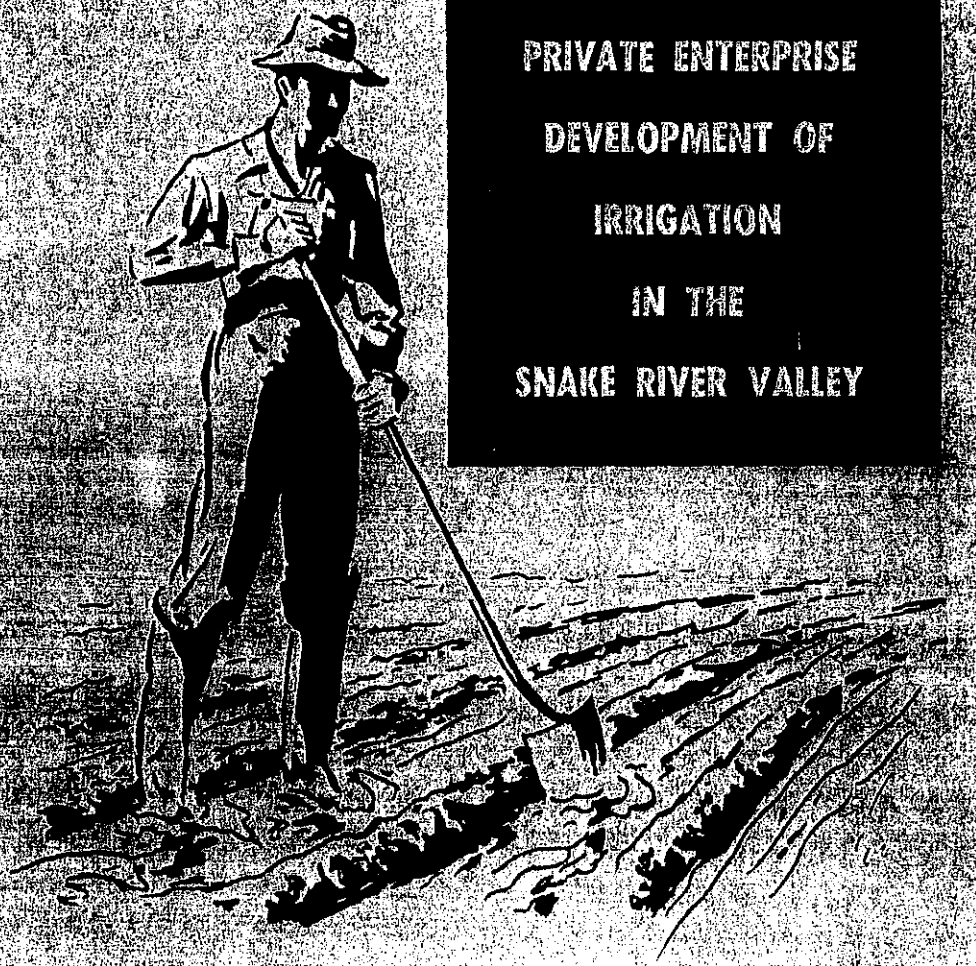
FIGURE 10.—Irrigated acreage, 1966.

Source: Goodell, 1988

Exhibit 458

WATER on the LAND

PRIVATE ENTERPRISE DEVELOPMENT OF IRRIGATION IN THE SNAKE RIVER VALLEY



Facts compiled by IDAHO POWER COMPANY

FOREWORD

History of the Snake River Valley's economic growth is synonymous with the development of land through irrigation.

Early irrigation was accomplished by diverting water from rivers and streams, utilizing natural forces of gravity to carry water onto thousands of acres of Idaho's rich desert lands and creating in the Snake River Valley one of the largest and most productive irrigation developments in the world.

A generation ago, with the opportunities for sound economic development of large scale gravity projects virtually exhausted, a significant change occurred in new land reclamation methods. Visionary men sank deep wells, tapping underground water to reclaim vast acreages where gravity systems were either impractical or impossible.

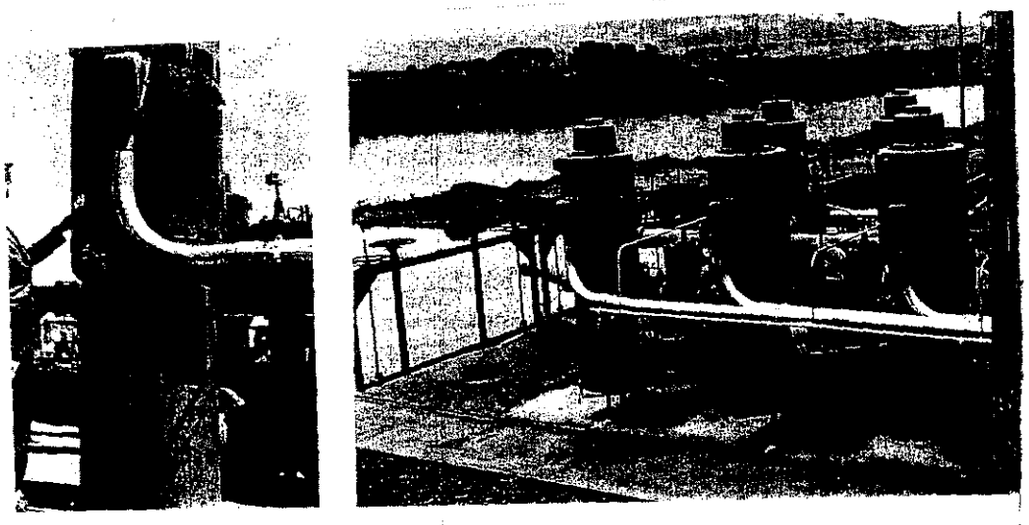
Thus began a second phase of Idaho's growth . . . an ingenious and enormous land development that in less than 20 years has added over a million new acres under cultivation. It is an expansion which has been accomplished by individual enterprise without federal aid, and no tax dollar obligation. This growth has outstripped any federal reclamation project in America, including the famed Columbia Basin project in Washington.

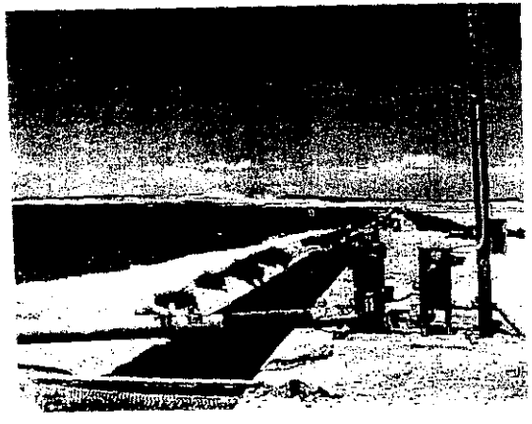
Millions more virgin acres wait only for the magic of irrigation. Continued expansion of any magnitude in the Snake River Valley will be accomplished only by pumping. Ample surface and underground water is available, and low cost, investor-owned power stands ready to pump it. Future orderly development, coincident with economic factors which justify land expansion, hinges on the encouragement Idaho and the nation provides for individual enterprise to create new agricultural wealth from Idaho's large areas of virgin desert lands.

This booklet discusses many little-known facts about the rapid development of this new-method concept in desert land reclamation and includes observations by some of the men who have played a vital role in its development.

Compiled and presented by

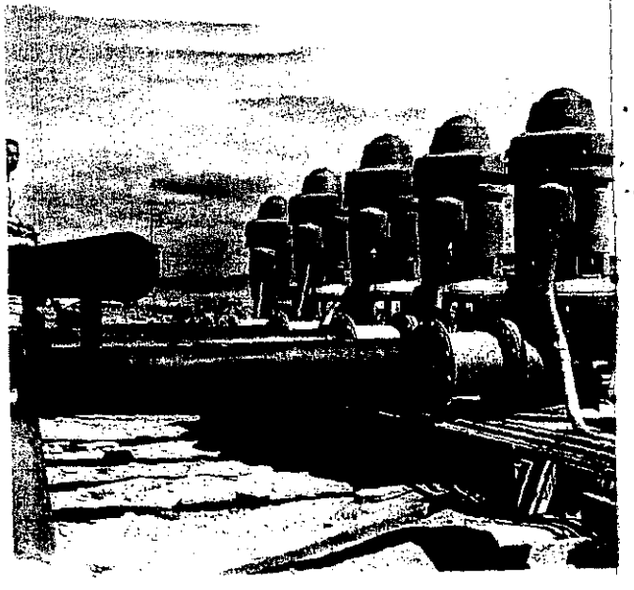
IDAHO POWER COMPANY

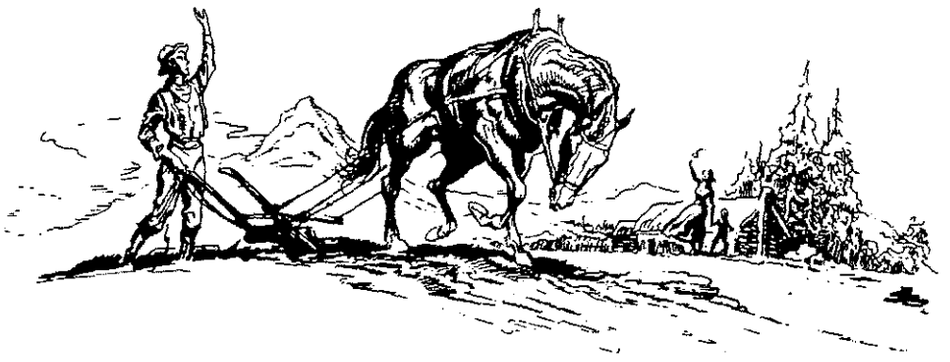




Enterprise Builds Idaho

Private development, without taxpayers' funds, is adding 50,000 acres of new Idaho croplands a year. Above, Sailor Creek pumps. Pumps below are part of the Dry Lake project.





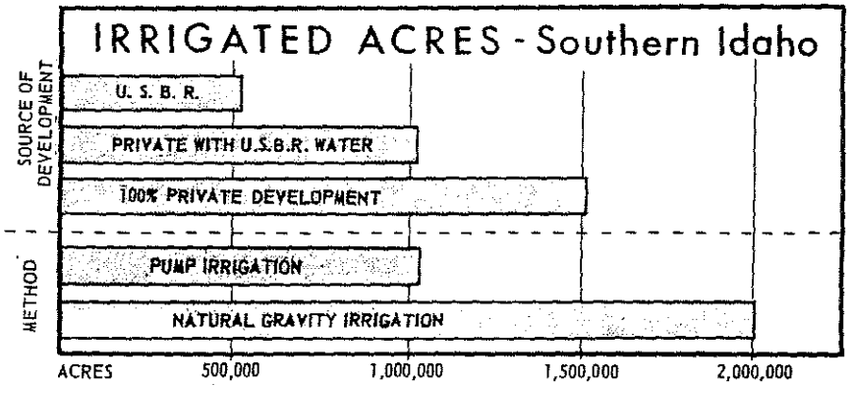
WATER ON THE LAND

A CENTURY OF DEVELOPMENT BY PRIVATE ENTERPRISE IN IDAHO

Idaho today ranks third in the nation for irrigated lands. Over three million acres of this development lie in the southern half of the state.

Extensive southern Idaho land development began shortly after the turn of the century through efforts of the U.S. Bureau of Reclamation and private developers. Today, about 500,000 acres have been developed entirely as Bureau projects, and another 1,000,000 acres developed by private enterprise receive supplementary water from federal storage projects. The remaining 1,500,000 acres have been brought under cultivation entirely by private enterprise without need for federal funds.

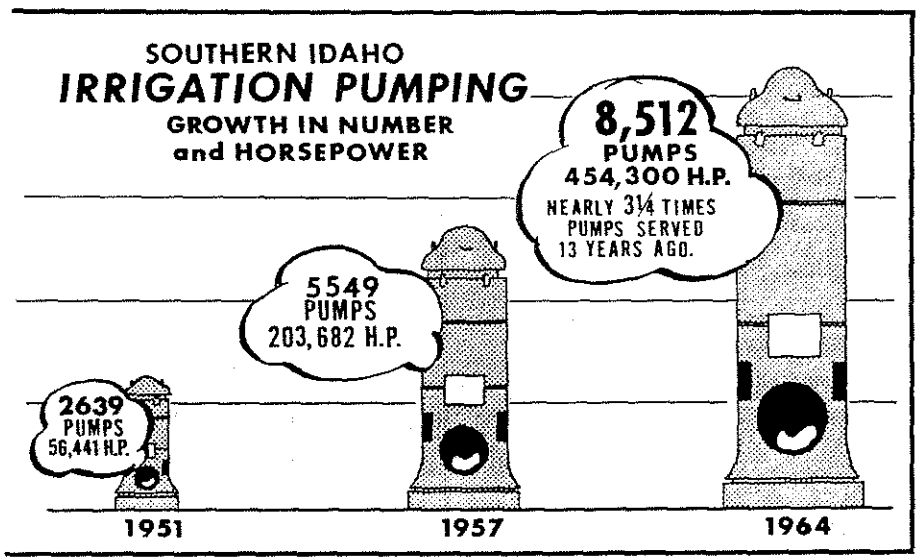
Over 1 million of these acres have been reclaimed by pump irrigation, either from deep wells into underground flows or reservoirs, or by pumping directly from the Snake River and its tributaries.



SPECTACULAR RECENT DEVELOPMENT

From a simple beginning with a few scattered wells sunk less than 20 years ago, deep-well pumping has grown spectacularly. Currently, new land is being placed under cultivation at a rate of 50,000 acres per year by individuals using private capital. This is the equivalent of a new "Columbia Basin" irrigation project in Idaho every 6½ years without a penny of taxpayer obligation.

Scattered across the width of Idaho, this fantastic growth is largely unrecognized. It has been quietly developed by individuals and companies receiving little publicity. Today, there are in operation over 8,500 irrigation pumps with a combined power requirement of 454,000 horsepower.



FUTURE POTENTIAL

Estimates indicate more than three million acres of undeveloped land suitable for irrigation and cultivation remain in southern Idaho.

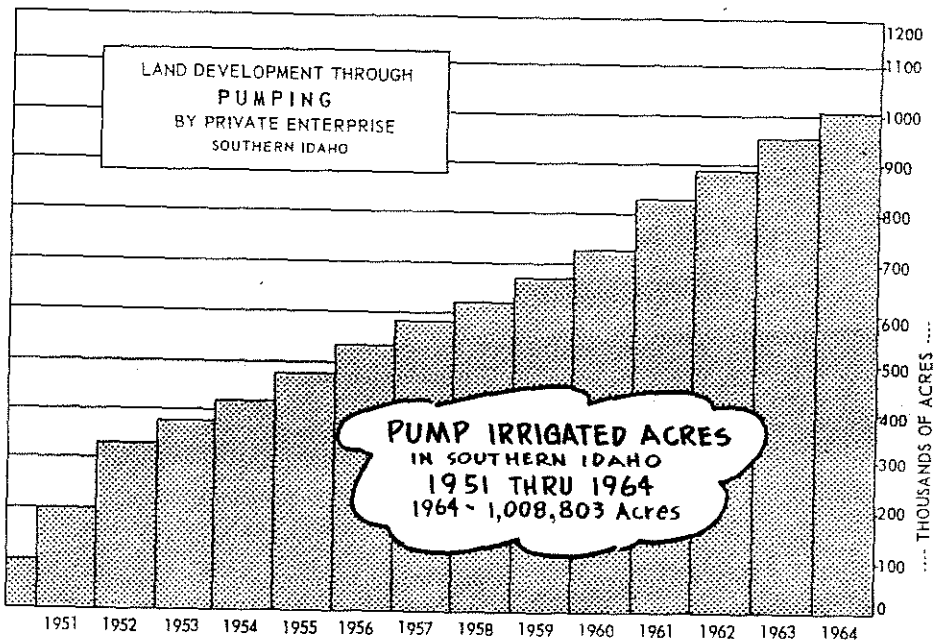
Among the larger virgin desert areas are: an area south of Mountain Home between Orchard and King Hill, and another area south of the Snake River generally extending from Bliss to Murphy. Many other areas of significant acreage are available along the entire length of the Snake River Basin, extending the full width of the State of Idaho.

UNLIMITED RESOURCES AVAILABLE

There appears to be an abundant reserve of water for the future. Some 11 million acre-feet of water leave the valley annually in the Snake River, and a tremendous reserve of virtually untapped underground water is evidenced.

Giant 1,250 horsepower electric pumps are already lifting water economically more than 600 feet, and higher lifts appear to be both practical and economical. The growing use of sprinklers for irrigation points the way to conservation of existing water, for better land use and for crop control. Ample investor-owned power is available for the foreseeable future at seasonal power rates that are among the lowest in the nation. Financing is more readily available as more and more projects are proving the sound economy of irrigation pumping.

It remains for the people of Idaho and the nation to do everything possible to encourage men of vision who will continue the expansion of irrigation pumping and help create the climate of economic factors which justify expansion of reclamation onto the more marginal lands by individual enterprise.



This chart shows the tremendous increase in pump-irrigated reclamation that has occurred in southern Idaho during the past 13 years, an average of 50,000 new acres under cultivation each year for more than a decade. Today, one-third of all farmland in southern Idaho is pump-irrigated, reclaimed by the individual initiative of private investors. (These figures do not include government or REA totals which would add about 100,000 more acres under pump irrigation.)

SOUTH-EASTERN IDAHO

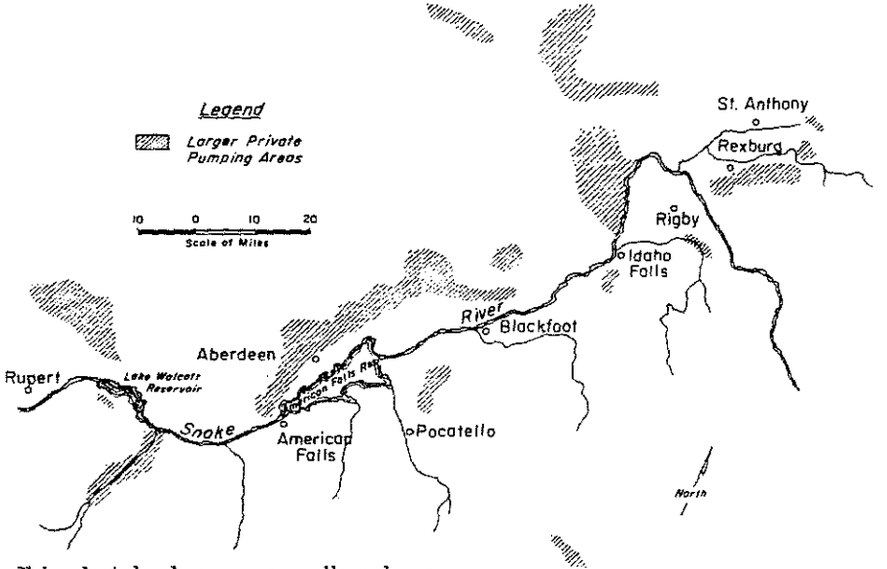
Pump irrigation in the upper valley, or Eastern Idaho, largely centers around Pocatello, American Falls, Aberdeen, Blackfoot, Idaho Falls, Rexburg, Montpelier and Preston. Scattered pumps operate in most irrigable sections of the area. Altogether about 425,000 acres are being supplied water by electric pumps, about half supplied with power by Utah Power and Light Company and most of the balance receiving their low-cost power from Idaho Power Company.

While lifts vary considerably, most pumping here is from 150 to 200 feet, generally with 70 to 100 HP pumps. Sprinkler systems dominate the application method.

At higher elevations growing seasons are necessarily short. Farmers concentrate on fast maturing crops such as potatoes, sugar beets, specific grains and feed crops.

PRIVATE RECLAMATION

PUMP IRRIGATED LANDS IN UPPER SNAKE RIVER VALLEY



This sketch shows generally where the larger sections of private enterprise development are located. Due to map size, smaller acreages (under 500 acres) are not shown, but there are a great many here.

SOUTH-CENTRAL IDAHO

Irrigation pumping in this middle valley area depends largely on deep-well pumping and here are located some of the deepest wells and highest pump lifts served by Idaho Power Company. In this area are some 360,000 acres receiving water from wells with an average lift of about 350 feet. Pumps average about 250 HP, but 400 HP pumps are not uncommon and some lifts here exceed 450 feet.

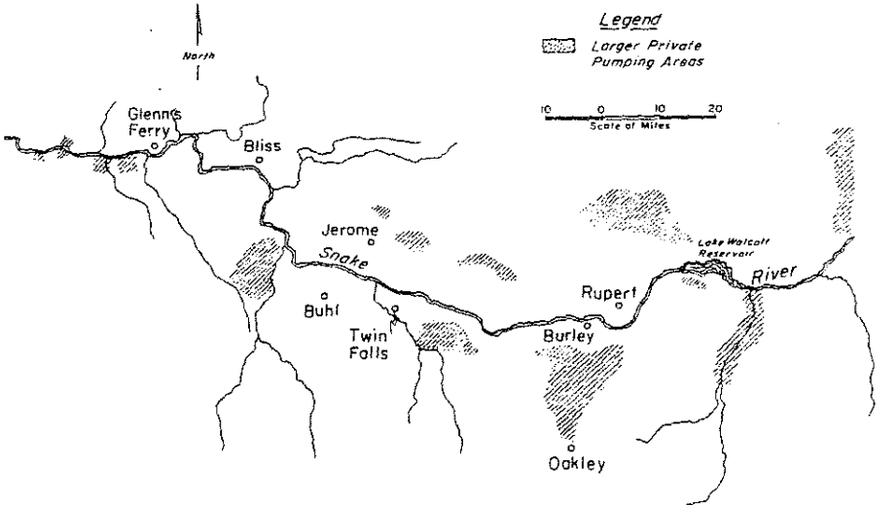
Longer growing seasons make possible a wider variety of high income seed crops in addition to heavier yields of beans, potatoes, sugar beets and onions.

While there are some large area developments shown on the sketch below, this area is typified by smaller (160 to 500 acre) farms, too small to show on the scale map. Developers here find seed crops highly profitable and the area produces a high percentage of the nation's garden seeds. Clean, sprinkler-applied water contributes to quality crops by reducing weed contamination, and provides easy control of seed crop maturity.

PRIVATE RECLAMATION

PUMP IRRIGATED LANDS IN MIDDLE SNAKE RIVER VALLEY AREA

(Acreages under 500 not shown)



ECONOMICS OF HIGH LIFT PUMPING

COSTS OF LAND RECLAMATION

Currently, desirable land under existing irrigation projects is valued at between $700 and $1,000 per acre. New U.S. Bureau of Reclamation projects, typified by the Columbia Basin Project, cost about $1,000 per acre to bring under cultivation.

Private enterprise development of new lands in the Snake River Valley costs significantly less than this. It is not unusual for new lands to produce crop values the first year sufficient to defray the total cost of the reclamation.

A typical example of an area where high lifts are necessary is at Dry Lake, where the experience of some 20,000 acres can be analyzed.

Privately owned desert land cost the developers from $50 to $125 per acre. Dry Lake total developments, including clearing, necessary leveling, complete pumping installations, ditches and sprinkler systems total from $225 to $325 per acre. Thus this new land, formerly regarded as not economically feasible for reclamation, was placed under cultivation for an average of less than $400, creating farm lands comparable to existing lands with a market value of $700 or more per acre.

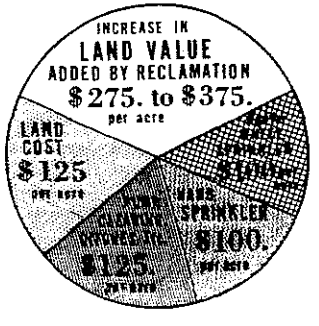
Many variable factors affect the total development costs of individual initiative irrigation pumping reclamation. The general pattern, however, shows this private enterprise opening of new lands to be a sound investment for developers whose initiative and ingenuity are making the best use of otherwise practically unused desert areas.

INCREASED LAND VALUATION THROUGH RECLAMATION

This chart, showing costs of development and the increase in land value that is added by reclamation, is based on the actual experiences of developers in the Dry Lake area on some 20,000 acres of desert land.

Estimated market value of land after reclamation, $700 or more per acre.

Costs of projects may vary greatly. Desert Entry land, for example, may initially cost as little as $2.00 per acre.



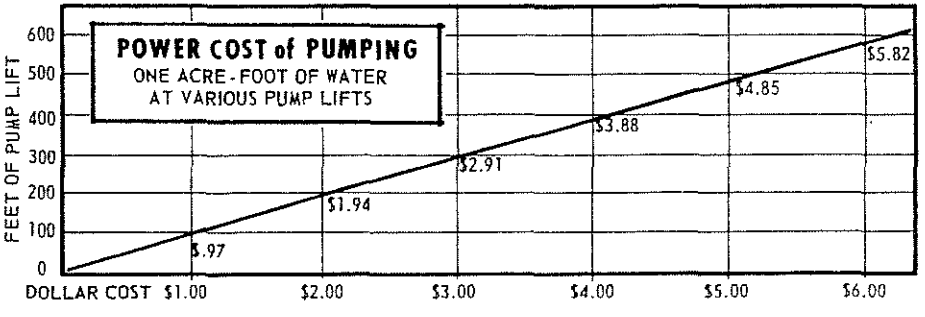
ELECTRIC IRRIGATION PUMPING ECONOMICAL

The unique characteristics of electric power, combined with its ready availability from investor-owned suppliers at rates among the lowest in the nation, have been significant factors in the steady, orderly and continued growth of pump irrigation reclamation in the Snake River Valley.

Today, virtually all power for pumping on the over one million new southern Idaho acres is being supplied by compact, highly efficient electric motors, some of which have been in continuous operation since the 1930's.

Actual power costs may vary from $4.00 to $20.00 per acre, depending on type of soil, application method, crop needs, weather, growing seasons, height of pump lift and other factors.

The chart below shows engineering estimates of electric power costs at various lifts for pumping one acre foot of water. These estimates indicate that many acres formerly regarded as economically marginal can now be reclaimed and placed in profitable production.



SPRINKLING COSTS

The growing use of sprinkler irrigation points the way to other avenues of operating economy. Sprinkling cuts water requirements up to 30%. It reduces weeding and cultivation costs. It reduces leveling costs, permitting greater use of the land and the development of thin soil areas unsuitable for ditch or flood irrigation. Electric power for sprinkling costs about $1.25 per acre foot.

NOTE: In the above estimates, no attempt has been made to include interest and amortization of investment since wide cost variations make generalization and averaging impossible.

HIGH YIELD — HIGH INCOME CROPS

This development is occurring in virtually every area of the Snake River Valley where rich lava-ash soils are adaptable to successful cultivation of almost any farm crop. Yields are heavy . . . but, significantly, these bumper crops do not contribute to the national crop surplus. A ready market generally exists for leading area crops such as potatoes, sugar beets, fruits, onions, corn, beans, a wide variety of seed crops, alfalfa, livestock and feeder cattle.

The availability of an almost unlimited variety of top quality farm produce has enabled the opening of 21 new food processing plants in the past 12 years, with a peak 1963 employment of over 7,000 people. These plants provide national distribution of canned, frozen and dehydrated Idaho produce.

While supplying fresh fruits and vegetables to these processing plants is high in economic importance, the area climate with controlled irrigation is especially adapted to raising of seed crops. Bean, carrot, onion and many other farm, garden and flower seeds are shipped all over the world. About 4/5 of the nation's requirements of hybrid seed corn is produced on valley farms. Comparatively new, bulb crops have been highly successful. For example, there appears to be an almost instant market for tiny cocktail onions, formerly grown and imported from Holland.

Crop values run consistently high. Typical of the 5-year average for two of the many basic area crops is shown in the following report of the Soil Conservation Service and the U.S. Department of Agriculture:

IDAHO STATE AVERAGE — CROP COSTS AND RETURNS PER ACRE

CROP	PRODUCTION COSTS	YIELDS	GROSS RETURN	NET RETURN BEFORE TAXES
POTATOES	$206.61	204 cwt.	$324.40	$119.79
SUGAR BEETS	156.94	20.2 ton	262.26	105.32

These are all-Idaho figures. They average the best with the poorest farm productions. Typical farms on pump-irrigated lands often exceed these averages, as in the case of Sailor Creek, where the first year potato crops ran 400 cwt per acre and Dry Lake, where the 1964 crop produced over 300 cwt per acre of potatoes and better than 25 tons per acre of sugar beets.

BROAD AREA BENEFITS

Spreading new wealth into every southern Idaho community, new farm lands have vastly enriched the economy of the state. Even using a low value of $200 per acre increase in value added by reclamation, these new acres have added over $200,000,000 to Idaho's agriculture wealth.

New lands require machinery, equipment, housing and labor. New businesses have been launched. Existing communities have been strengthened and stabilized. New processing plants have opened, and fertilizer industries have been expanded with more millions of dollars invested.

It is estimated that three new jobs are created from each 100 acres of new land, one on the farm and two in supporting or related industry. On that basis, thousands of new jobs have been created from this new land development.

The tax base of all southern Idaho has been broadened with increased values on land and improvements, crop incomes, worker wages, processing facilities and taxes on the increased facilities installed by investor-owned utilities that serve these vast new developments with low-cost power.

These are just a few of the area economic benefits that automatically accrue as new land is developed . . . and they remain as powerful benefits, providing added wealth and opportunity for generations to come.

Irrigation pumping has enjoyed a healthy and orderly development, taking place just as fast as economic factors justify the expansion onto new areas. Land can be placed under cultivation fast—in most instances crops can be harvested the first year.

Private initiative development requires no tax dollars or subsidies. Modern agricultural pioneers are ready and willing to take the risks and invest in new land opening. Idaho needs the use of all her available water for present and future developments.

Idaho's future may well depend on how well she encourages these men of initiative, imagination and faith in the future to continue the reclamation of new lands and strengthen the economy of this great, comparatively virgin western country.

CROP PRODUCTION FIRST YEAR

MEN OF VISION

Idaho's pump-irrigation development was pioneered by imaginative men who invested their own time and money to prove the feasibility of tapping underground and surface water to cultivate the desert. Their vision and determination has added untold new agricultural wealth to Idaho's economy . . . a vast new resource that will continue to expand for generations to come.

Observations by investors, developers, irrigators and men in allied industries provide a challenge to Idaho people to provide the political and economic climate that will encourage the continued efforts of these modern day pioneers.

Lower Cost

— New Land Faster

"We of the Travelers Insurance Company have considered it a privilege to take part in the dynamic development of the Dry Lake Area through irrigation pumping from the Snake River. The Travelers has invested substantial amounts of money through mortgage loans to private farmers who have brought into production thousands of acres of rich farm land from the desert.

"These desert acres cost as little as 50¢ per acre on up to $250 per acre. The cost to irrigate these desert acres has run from $200 to $250 per acre. The total investment has run from $250 to $400 per acre. This land development represents about one-third the cost the federal government had estimated would be necessary, and it has been done approximately in one-third of the time the federal government indicated it would have taken to accomplish the same task.

"In the Dry Lake Area alone, the land so developed, is now valued at approximately ten million dollars. In addition to the development costs, these farmers have purchased approximately two million dollars worth of machinery to farm that ground. This is economic development for Idaho in the finest sense, and Travelers Insurance Company is proud to have been a part in this development."

DONALD S. REED, Mortgage Loan Representative,
The Travelers Insurance Company

Pioneer Spirit

"Irrigation Service, Inc., is proud to have been a part of the private irrigation development in the Dry Lake area, south of Nampa, as well as other individual projects throughout Southwestern Idaho. We believe that the pioneer spirit and the obvious pride of development of the individuals involved should be commended. Their foresight has indeed provided a real contribution to the future of our community, state and nation."

EUGENE R. JOCHENS, Nampa Manager,
Irrigation Service, Inc.

Gives Personal Control

"Having the source of water on my own farm and having personal control of the water has not only been very satisfying but has proven profitable. It isn't necessary to co-ordinate my watering with anyone else and I can have water as late in the fall or as early in the spring as needed for special crops or for especially dry springs or falls. My private pumping development has been profitable. I'm certain I have been able to control the development costs by developing the project as an individual. I'm certain that my efforts have added to the local economy."

WILBERT H. MOLLER, Farmer, Rupert, Idaho

Great Potential

"It has been a privilege to serve the many needs of irrigators with pumps and sprinkler equipment from rivers and wells. We feel the future of our great potential is dependent on agricultural development of this type."

HARLYN J. WOOD, H. J. Wood Co., Boise, Idaho

Community Support

"I started my deep well irrigation pumping operation on Michaud Flats west of Pocatello in 1953. As one of the pioneers of this area, I have proven my deep well pumping to be successful and others have followed my operation and found it has also been an answer to solving their problems. By bringing the desert land into cultivation, I feel that I have contributed greatly to the support of my community. Had it not been for this private development, there would be thousands of total acres lying idle instead of being in productive farms today."

J. W. PRIESTLY, Pocatello, Idaho

Private Capital — Individual Initiative

"Over most of the past 72 years our Company has financed and helped establish thousands of acres of gravity and pump irrigation developments throughout Southern Idaho and surrounding states. These lands have been engineered and financed with private capital and completed by individual initiative. They are operated and managed by private individuals and private companies.

"Through this method, we believe the development has been sound, orderly, economical and guided by the individual judgment of thousands of experienced farmers and businessmen.

"As one of the largest mortgage lenders in the Intermountain West, we have the facilities and stand ready to continue helping in the future development of Idaho's land and water in a manner that will give the maximum permanent economic growth from these two important resources."

DAVID R. MEAD, Assistant Secretary and
Manager, Twin Falls Office
Utah Mortgage Loan Corporation

Pumping Best Answer

"I feel the electric pumping has been the best answer in developing 500 acres near Meridian, Idaho. We experience no weeds, saves leveling costs, and we have water whenever we need it with sprinkler pumping. All our neighbors have since installed pumping."

M. A. STICKLER, Boise, Idaho

Continued Growth in Processing Plants

"The development of one million acres of new land by pump irrigation in southern Idaho has made possible a vast new food processing industry, which greatly benefits the agricultural economy and the business economy of the entire area. With another million or more acres of the same type of high quality land which should be developed in the relatively near future by irrigation pumping, we can look forward to a continuing dramatic increase in processing facilities here.

"These plants assure farmers of a ready market for their farm produce, even before the crops are planted. Area processing plants require tremendous investments, employ thousands of people in food handling, marketing and transportation, and benefit the farmers, the businessmen and the citizens of the area alike."

J. R. SIMPLOT, President
J. R. Simplot Co., Boise, Idaho

For the Good of All

"The Basin Land Company was the first major land developer in the Dry Lake Area south of Nampa. At that time, to lift water 525 feet, and to lift it still further through sprinkler pressure, was considered by many people to be not economically feasible. Our Company invested substantial amounts of money in the land as well as the irrigation system to farm 4,200 acres, yet today our business judgment has proved fruitful because this is a sound, economic venture.

"We have added land, at appreciably increased value, on the tax rolls of the State and County, have produced taxable wealth, and have employed many people, and at the same time fostered a vigorous new company.

"As President of the Basin Land Company, I have been personally gratified not only with the success of this endeavor, but also to realize that private initiative and private capital can still accomplish outstanding benefits for the good of all."

R. L. RICE, President
Basin Land Company, Inc., Nampa, Idaho

Future Welfare of Idaho

"For many years I had a vision of beautiful, productive farms in the Dry Lake area south of Nampa. Along with others I was quite active in encouraging the Bureau of Reclamation to proceed with their plans to irrigate this section.

"When the idea and feasibility of pumping from Snake River were presented, I was glad to cooperate with the other farmers in development of this fine land. I feel that the economic contribution of the area is equal to many large industries and is a tremendous investment for the future welfare of Idaho."

JOHN H. BRANDT, Brandt Agency,
Nampa, Idaho

New Job Opportunities

"My company is pleased to be a part of the development of water and land in Southern Idaho. We feel we have provided good service to many individual pump land farmers. The results of years of privately financed research and development of pump design are available to each individual pump owner.

"Southern Idaho's irrigation pumping development is an example of private enterprise in action. The Layne & Bowler Pump Company has invested appreciable sums of money to compete for a portion of this type of pumping business. It has created jobs and helped to substantially increase the economy of Southern Idaho."

THOMAS M. THOMPSON, Manager
Layne & Bowler Pump Company, Twin Falls, Idaho

Pumping Speeds Development

"New types of farm equipment have contributed in helping open up new tracts of land. Pumping water from rivers and wells has made it possible to develop new land with private capital in helping farm operators with their problems."

RAY HARRIS, Harris Truck & Implement Co.,
Mountain Home, Idaho

Power on Fast Call

"Our food processing business is primarily geared to agricultural development. We use the products grown on some 25,000 acres of land annually. For a proper three-year crop rotation program, this involves about 75,000 acres of crop land at present time.

"Our business has been developed on a free enterprise basis and the agricultural development, community work force and investment, and power utilities have all cooperated towards our success.

"Land development has been particularly necessary in keeping pace with our raw product needs. Large tracts adjacent to the Snake River water supply in southern Idaho have been developed. Adequate power for these vast water pumping projects has been necessary on an economical basis.

"Another great private enterprise business, Idaho Power Company, has been most cooperative in supplying this need. On fast call, the power has been made available to all pumping areas and to the processing plants themselves."

F. NEPHI GRIGG, President
Ore-Ida Foods, Ontario, Oregon

Wonderful Experience

"We in the Hat Butte Mutual Canal Company are real proud of the development in the Dry Lake Area, and are happy to be a part of this. By bringing the desert land into cultivation I feel that we have contributed greatly to the support of our community in which we all live.

"Had it not been for this private development there would be thousands of total acres lying idle, instead of being in productive farms today. This has been a wonderful experience for both my son, Maurice Clements, and myself and we feel our pumping water on new land has been a good answer to our problems."

M. O. CLEMENTS, Nampa, Idaho

Thankful for Opportunity

"Merrill and I have been pumping water from the underground supply on the North Side for fourteen seasons. During this time we have seen the desert change from sagebrush land to beautiful farms. We have been privileged to have had a share in the development of this beautiful farming area that has contributed so much to the economy of Minidoka County and the State of Idaho.

"Our operation has also developed with the growth of this area which would not have been possible without the underground water and the power to pump that water onto the land. Idaho Power Company has furnished us with the electrical energy to pump this water. We are indeed thankful for the opportunity; that the land, the water, and the electrical power have made these things possible."

ROGER E. DEAN, Rupert, Idaho

Sound — Orderly — Economical

"The full economic development of Idaho as it affects the beneficial use of land and water resources requires the effective use of all interests, private and governmental. In my efforts I've leaned heavily on the cooperation and guidance of state and federal institutions and agencies but have found private sources of capital and many privately owned companies and individuals ready and eager to take on certain reclamation jobs.

"I have organized and helped establish many of these irrigation pumping projects throughout Southern Idaho — with private capital. I believe these developments have been sound, orderly, economical, and guided by individual judgment of trained people in and out of government agencies, by hundreds of experienced farmers, and businessmen.

"The future development of land and water should continue in this fashion on several hundreds of thousands of acres if Idaho is to receive the maximum permanent economical growth from these resources."

G. T. NEWCOMB, Twin Falls, Idaho

Productive Enterprise

"My pump farm is the result of the combined efforts of myself and private contractors. I know that development of water and land by private individuals like myself results in a well-planned productive enterprise. I have taken personal financial risks, but this is the secret of success of this country. The risks proved to be good ones and I feel that the opportunity for future private development of water and land in Southern Idaho should continue. Communities will develop by substantial, healthy growth when private individuals do the job through their own initiative."

J. W. "JIM" HENRY, Hazelton-Rupert, Idaho

Idle Land Put to Work

"The development and use of underground water by individual farmers has been very successful in our area. Non-productive, idle land has been put to beneficial use through this method of irrigation. My particular farm would not be producing today if it were not for this type of development. I feel that I have contributed to the stability of the economy of the community through this project and can say that it has been a good investment for myself as well as others using this form of irrigation."

WILSON NOWELS, Aberdeen, Idaho

Development Will Continue

"Most of our pump sales in Southern Idaho have been to private individuals or private companies. This Company believes that our business here is sound and has invested large sums of money in service facilities and equipment to continue to serve our customers. We feel that we have made a real contribution to the economy. Our business is geared to serve individual pump customers. We plan to compete for a share of the future pumping business in Idaho and hope the development will continue as it has during the past 10 to 15 years."

J. S. DUFFEL, Manager
Layne Pumps, Inc., Twin Falls, Idaho

Processing Plants Made Possible

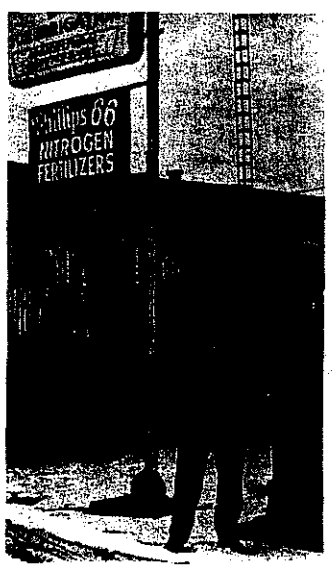
"Enterprising individuals from various walks of life and with varied skills and abilities have combined efforts to develop hundreds of thousands of acres of new land in Southern Idaho with irrigation pumps supplying the water.

"Our processing plants were made possible by the volume of produce now available from these new lands, added to the existing production of established crop land. The new land has created, directly and indirectly, thousands of new jobs for Southern Idaho.

"Processing the crops grown in Idaho is a logical step towards further industrialization of this area. Much growth thus far can be attributed to private enterprise. Many farms and processing plants are being privately financed and privately operated.

"I plan to continue to help and encourage present and future water development. Every individual and business in Southern Idaho has an opportunity to benefit from this type of development of land and water."

VANESS ANDERSON, Burley, Idaho



Increased Land Value

"Agricultural Services, Inc., Blackfoot, Idaho, an independent corporation, has promoted Idaho land development since 1952 through sales and service of deep well pumps, sprinkler irrigation systems, fertilizer and chemicals. A new office building and bulk fertilizer plant were built in 1964. The fertilizer bulk plant has 6,000 ton capacity per season.

"Complete financial aid has been made available to our Idaho Farmers for land development and land production. Agricultural Services, Inc., has assisted with increasing Idaho land valuation to an average of over $1,200,000.00 per year. This has been made possible through the development by private pumping."

THOMAS B. SLAYTON,
Agricultural Services, Inc., Blackfoot, Idaho

Sound and Reliable

"Our bank has had the privilege of serving many new customers and has added services for existing customers as a result of the pump land development in this area. We look upon this growth as sound and reliable. Substantial additions to our service personnel and facilities were made possible by this new business.

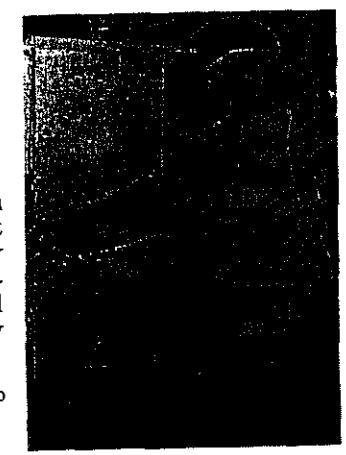
"Developments such as this by private, individual farm businessmen have brought solid growth to the economy of the area we serve. We believe in private enterprise and are looking forward to the future development of Idaho's land, water, and business."

R. D. McKINNEY, Mgr.,
Twin Falls Bank and Trust Co., Kimberly Branch

$15 Million Annual New Wealth

"The development of pump irrigated lands in Idaho by individuals, without government help, is the largest on record. The farmers of Bingham County have cleared the sagebrush, leveled the land, drilled 935 wells, made the ditches and put under irrigation 135,000 acres of land in the last 15 years. This has helped make our county the largest potato producing county in the nation. Fifteen million dollars of new wealth is produced annually on these new lands which has made possible many new businesses to be established in this area, and has helped every segment of our county economy."

C. L. WILLIAMS, Blackfoot, Idaho



Individual Development

"Development by the individual has been very successful in Southern Idaho. Had it not been for this type of development, my farm would still be non-productive or unprofitable . . . It has proved to be a good economic investment for myself and many other individuals in Southern Idaho."

C. W. "Chet" McCLAIN, Castleford, Idaho

Tax Roll Benefits

"As the developer of the first piece of ground upon which water was lifted from the Snake River in the Dry Lake Area, it is a pleasure to state that this has been a splendid economic development for me. Since that time, I have participated in ventures to bring under cultivation thousands of acres at the Sailor Creek Project. This too has been very successful. Because of this, we are planning more developments up and down the Snake River.

"Through the combined efforts of private individuals, like myself, who have invested their private capital, it has been possible to bring about a large amount of economic gain to many people and to the tax rolls of the counties and the State of Idaho.

"Development costs have been about $350.00 per acre on federal ground ıd $450.00 per acre on private ground. These are very favorable economic ıses from which to build more developments, as we have in the past.

"I, personally, am very pleased to be a part of this new concept and gain ır the citizens and the State of Idaho."

ALLEN NOBLE, Nampa, Idaho

A GREAT FUTURE FOR IDAHO RECLAMATION